Urban Agriculture Research in East & Southeast Asia: Record, Capacities and Opportunities

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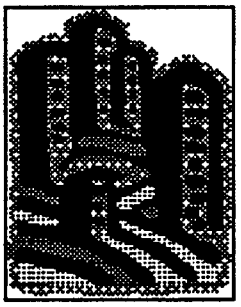

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URBAN AGRICULTURE RESEARCH IN East and Southeast Asia: RECORD, CAPACITIES AND OPPORTUNITIES

INTRODUCTION

Urban agriculture is one of the most neglected dimensions of development in Asian cities, notwithstanding its obvious importance for the sustenance of the cities themselves and the quality of life of their inhabitants. To date, very little in terms of systematic research has been undertaken and what little research has been conducted has not elicited widespread attention from scholars, planners or policy makers. It is relevant to note the efforts of the Resource Systems Institute of the East-West Center in Honolulu in food and energy research in Asian Cities (Bardach, 1982, 1984), and a five-country project on the Effects of Rapid Urbanization and Population Change on Food and Fuel Requirements in Asia (Pernia, Ogawa and Wirosuhardjo, 1984). The latter project involved the participation of researchers from Indonesia, Japan, Korea, the Philippines and Thailand and was funded by the East-West Center. As far as could be perceived, the generative impact of these efforts for further studies by researchers has been weak, leaving aside the question of any direct influence on policy-making. Even the most laudable and almost messianic efforts of Isabel Wade of Urban Resource Systems in San Francisco have not led anywhere (Wade, 1981, 1984). In the belief that there was something the Urban Policy Program of the IDRC could contribute to this research gap, a project development meeting was organized in ASRO in 1983, but for various reasons a fundable project did not come about. In an effort to take stock of developments in the field and building on IDRC's limited involvement in 1983, Yeung (1985) completed a state-of-the-art review on the subject for Asia.

Three reasons may be proffered for the relative lack of interest from researchers willing to venture into this subject. First of all, urban agriculture does at first sight appear to be a contradiction in substance where, under usual circumstances, agriculture is practised in rural areas. There is indeed, on the surface, relatively little that can be done, let alone researched. It is unthinkable for many to believe that urban farming can be of any significance in crowded and land-scarce Asian cities, particularly in large cities such as Tokyo, Seoul, Hong Kong, Singapore and Taipei, and in the central urban areas. People living in these dense urban environments simply do not find land or time to engage in any

sort of food-producing activities. Whatever free time they might find, they would pursue leisure or recreational activities. To researchers and policy makers alike, urban agriculture is not a subject high on their agenda for attention, action or funding. This attitude pervades in many Asian cities. The second reason for the relative lethargy to the subject is that urban agriculture is one that is concerned with the urban poor for the most part, as they can use homegrown food to supplement their income and household resources. Even if planners wanted to help, there would be little they could really do since urban farming needs land, which should best be left to the devices of the poor to identify and access on their own. Thirdly, the scientific and technological aspects of food production within cities, such as improved methods of pig farming, new breeds of chicken for higher yields, and practical ways of helping fish farms to minimize loss from water pollution, appear to be well developed. These studies are focused primarily on production and efficiency and rarely venture into socioeconomic domains.

As far as the objectives of urban agriculture as identified in the URB Program document are concerned, it is not an exaggeration, based on the comments made in the previous paragraph, to say that none can be viewed as well researched. The program has correctly identified the removal of social, economic, cultural and environmental obstacles as the primary step in advancing urban agriculture in Asia, as Yeung (1985:39) has also argued. The actual and potential relations between water, hazard, waste management and urban agriculture should as well be explored, but in my view these should be considered as additional payoffs and widened perspectives in approaching the subject. They should not, however, be constraints or prerequisites in themselves in approaching studies in urban agriculture.

1. REGIONAL RESEARCH RECORD: STRENGTHS AND WEAKNESSES

In respect of outstanding studies on urban agriculture, it should be prefaced by a clarification that although studies on urban agriculture as such are not plentiful, many studies bearing on food production and distribution of various kinds are found in many cities in Asia. James Jackson (1979) has studied daily food markets in Greater Kuala Lumpur and Cheng Lim Keak (1981) has examined fresh food supply in Singapore. Yeung (1978) has studied the night markets in Singapore, which have been phased out but at the time of their operation did play a role in food distribution. T.G. McGee and Y.M. Yeung (1977), moreover, documented the results of a six-city study on hawkers and vendors in Southeast Asia supported by IDRC, in which food distribution by the informal

sector was shown to be not only important but to provide, as well, an avenue for productive employment for many people. The best study of an Asian city in terms of the relation between food and energy is one undertaken in painstaking details and over time by an Australian team on Hong Kong in the late 1970s, as reported in part by Newcome (1977). The study was scientifically and carefully conducted, with a great deal of documented results. Yet even such a study did not appear to have any lasting impact of note, on Hong Kong itself or the academic community. Looked at in a broader ecological setting, Chinese cities have attracted considerable research interest because of their ability to feed their populations within their urban regions, as studies by Hawkins (1981) and Skinner (1981) have shown. In the Pearl River Delta, an efficient ecological cycle of combining mulberry/pig/fish production through construction of dykes and ponds has been perfected (Zhong, 1980), although recent rapid economic development consequent to the open policy has created changes to the age-old pattern. All these studies have relevant information that can be utilized for policy-making in respective cities and countries.

As to specific work on the science and technology of food production in urban settings in Asia, much has been achieved. This kind of work is primarily undertaken in universities or research centres. For example, S. T. Chang, of the Department of Biology at the Chinese University of Hong Kong, has pioneered in the production of mushrooms and has been recognized in his work by United Nations organizations and Chinese researchers. K.C. Lam and K.C. Chau, of the Department of Geography at the same university have been engaged in research to use organic waste to effect soil modification to improve vegetable growth. Similarly, Daniel K.O. Chan, of the Department of Zoology at the University of Hong Kong has achieved equal distinction in his research on the eel over several decades. The Primary Production Department in Hong Kong is always active in improving ways of rearing livestock, and of producing fish and vegetables. Recently a new way of treating piggery waste was experimented with success and has helped control water pollution in water catchment areas. These are several noteworthy attempts within Hong Kong and similar research has been ongoing in other cities in Asia.

Regarding scientific and technological work on agricultural production, the work of several research institutes in Taiwan warrants specific mention. These include the Agricultural Extension Centre of the Taichung District Agricultural Improvement Station, with outstanding work on hydroponics; the Chinese Society for Horticultural Science in Taipei; and the Asian Vegetable Research Development Centre in Shanhua. Research undertaken in these and other centres have accounted for Taiwan's continued progress in

agricultural products for local consumption and export. Taiwan, for this reason, essentially monopolized the world market in dwarf corn and certain breeds of mushroom.

Following the realization of market potential in the wake of the open policy in China, many Chinese cities are also actively improving their agricultural products through research and exchange of information with outside scholars and bodies. The aspirations of the Chan Fong Lau Chee Experimental Farm in Dongguan, Guangdong to become the largest and the best lychee production centre in the world is a case in point. In 1992 more than 5,000 trees of lychee were planted in the farm but as lychee is a highly perishable fruit that has to meet the discriminating taste of the consumer in terms of water and sugar content, size of seed and texture, much research needs to be undertaken on improving quality, marketing and distribution. In China, scientific research on food crops, vegetables, trees and fish is facilitated by the existence of a network of agricultural universities that are found in many large cities. Many academic journals and popular magazines are published on a variety of agricultural topics.

The URB Program document outlines a list of potential subjects for research in urban agriculture. They are all important issues worthy of research support. However, one dimension that is not adequately addressed in the document is the need to promote attitudinal change among researchers and policy makers in their perception of the role of urban agriculture. As the URB Program document is conceptualized, the problem is intertwined with issues of the urban poor and disadvantaged population groups. In other words, the social and perceptual aspects of urban agriculture constitute a critical focus of urban agriculture if this component of urban development is ever to elevate itself in importance in policy-making circles. It is not an easily researchable dimension but it should not be neglected. This can also be built into any research design.

Lastly, regarding the possible interrelations existing between urban agriculture, water, waste and disaster in East and Southeast Asia. It is difficult to generalize, but depending on what aspects of urban agriculture is in question the links can be established. The Hong Kong nutrient study referred to earlier, for instance, showed the strong connection between use of organic waste and pig rearing (Newcome, 1977), and the most efficient ecological cycle developed in South China also referred to above harnesses organic wastes from fish and pigs to good effect and in the process, nothing is wasted (Zhong, 1980). Although the interface between urban agriculture and the other key elements is important, it should not, in my opinion, occupy the central position in our approach to urban agriculture issues.

2. APPRAISAL OF RESEARCH CAPACITY

Although five research foci have been identified in the URB Program document in the proposed program for urban agriculture, it is considered more appropriate for this section to list relevant institutions and researchers by country, with some comments on their capacity and track record, so that when decisions are necessary for involving any of them, an assessment may be made of their appropriateness on this basis. It should be stated at the outset that the record of research on the scientific and technological aspects of food production in the region is much stronger than that on community participation and the urban poor in urban agriculture, as emphasized by the program. An incomplete listing of institutions and researchers in East and Southeast Asia may be found as follows:

CHINA

China is a vast country with many talented and devoted researchers in many institutions having interests in researchable subjects of every description. I have not exhaustively searched for individuals who have interest in the subject but the several feelers that were sent out have turned in the following names, with a bias towards South China because of geographical proximity to Hong Kong. It must be emphasized that many other potential researchers and institutions exist in China.

- Chi Juqing, Director and Associate Professor, Scientific Office, South China Agricultural University, Wu Shan, Guangzhou. He has extensive experience in general agricultural research.

- Li Naiqiang, Director of Guangzhou Fruit Research Institute, Vice-Chairman of the Guangzhou Society of Agricultural Science, Guangzhou. He is an agronomist by training and capable of researching on fruits.

- Zhang Shanwei, Professor, Fruit Tree Research Institute of Guangdong Academy of Agricultural Science, Guangzhou. He specializes in lychee research and development.

- Wu Shangshong, Professor who is trained in plant pathology, based in Guangzhou.

- Ning Yue-min, urban geographer who has written one of the first urban geography

textbooks in China, has broad interest in the development of Shanghai. Based in the Department of Geography, East China Normal University,Shanghai. Young and dynamic, he should be a good person to involve in any urban agriculture study in China, particularly in Shanghai.

S. KOREA

Several researchers from Korea have interest in urban agriculture and are described below:

- Ki-suk Lee, urban geographer and Associate Professor at Seoul National University, with a Ph.D. from the University of Minnesota. He has broad interests In urban and regional development of Korea and has published on the urban development of Seoul. A serious and able researcher who led the IDRC-supported study of export-processing zones project in Asia for Korea.

- Shin-Pyo Kang, American trained anthropologist who has broad interests in development. In a recent academic meeting in Beijing, I was impressed with his enthusiasm in field work and line of questioning while we visited a former commune, now called a village, specialized in vegetable growing. The village was called "Four Season Spring." He is from the Department of Anthropology, Hanyang University, Seoul.

- Kim Son-ung, American trained sociologist who previously worked for the Korea Development Institute when I met him. He was coordinator of the IDRC-supported study I developed on factory workers in a new town near Seoul. He has since been with the Department of Sociology, Hanyang University, Seoul. He is a capable researcher, willing to explore new fields.

PHILIPPINES

In recent years many NGOs or consultancy groups have sprung up which have conducted interesting research work. Thus in the Philippines one should look at usual researchers from universities as well as such sources.

- Alejandro Herrin. He was previously involved along with two researchers in a food and fuel project for the Philippines. He was based at the University of the Philippines and can be considered a researcher for potential involvement.

- Cayetano Paderanga, Jr., Professor of Economics at the University of the Philippines trained initially as a geographer. He worked previously at UNCRD, Nagoya and has valuable international collaborative experience. One of his latest interests is the extended metropolitan region of Manila, within which many urban agricultural activities take place.

- Nap Jamir, a researcher from an NGO who reported in 1983 on a most interesting case of a short-lived but innovative experiment of urban agriculture in Manila - in fact in a small district called Matalahib within Manila. It would be useful to find out if his group or himself have maintained an interest in the subject. Mr. Jamir was Founder and Technical Editor of Earthman Society, Manila.

- Jose Antonio League, of Urban Planning and Urban Management Consultants, is an able researcher who has worked on urban management issues in Manila. He would be a potential candidate for consideration of urban agriculture studies in Manila.

HONG KONG

I would not repeat some of the names already mentioned above on the scientific research on different aspects of food production. However, I would mention the following having possible interests from the viewpoint of urban agriculture.

- Tang Wing-shing, geographer at the Chinese University of Hong Kong has done most of his research on Chinese cities. He was trained in Toronto and Cambridge and has youthful enthusiasm to do research. He should likely have an interest in urban agriculture in Hong Kong.

- Rebecca Chiu, urban geographer who obtained her Ph.D. from Australian National University now working as Lecturer in the Centre of Urban Planning and Environmental Management at the University of Hong Kong. She has worked largely on housing issues in Hong Kong and China, but her broad interests in urban issues could conceivably take her to a new field.

THAILAND

I would mention three possibilities in this country where much scope exists for urban agriculture, two in Bangkok and one in Chiang Mai.

- Pawadee Tongudai, Economics Professor at Thammasat University in Bangkok. She was trained in the U.S. and has an excellent track record of research on Bangkok. She was previously involved in a multicountry study on urban food and fuel in Asia and should still be interested in doing more work.

- Watana Isarankura, Associate Professor of economics at the National Institute of Development Administration in Bangkok. She is a capable researcher with a respectable record of doing good work and delivering it. She has recently published useful articles on Bangkok.

- I am not up-to-date on the research situation in Chiang Mai, but I used to involve researchers from the Social Research Centre of Chiang Mai University in a Low-Cost Transport study. Urban agriculture is plausibly important in a secondary city like Chiang Mai and it is worthwhile to look.

MALAYSIA

In 1983 I invited researchers of the Consumer Association of Penang (CAP) to report on a case study of land security affecting vegetable growers on the island. When I enquired if there was any recent work on the subject, I was told that there was more lobbying than research. However, the person who was an advisor to CAP and who participated in the 1983 ASRO meeting has moved to the University of Malaya in Kuala Lumpur. Interestingly, he has kept his interest in the subject and has written two recent papers on vegetable farming and livestock farmers in Malaysia. He is Professor Lim Tech Ghee, at the Institute for Advanced Studies, University of Malaya. He is certainly the best person to involve should there be any study involving Malaysia.

Another person who might be able to contribute is Gurgit Singh, a young and dynamic urban planner who participated ably in the World Bank Housing Indicators Survey. Educated in Cambridge University, he works for Sime Darby Plantations but should be a useful contact person at least if he himself is unavailable in taking part in a collaborative research project.

SINGAPORE

I have only one name from this city-state whose earlier work suggests that he might be interested in urban agriculture in this island country. He is Dr. Cheng Lim Keak,

Senior Lecturer in geography at the National University of Singapore. He has recently published a volume on Singapore Chinese and is likely to Welcome an opportunity to work in a field he is familiar with.

INDONESIA

This sprawling and still largely agrarian country holds much scope for urban agriculture, with traditional kampungs found in many Indonesian cities. I would mention three names from Jakarta and Bandung.

- Mohammed Soerjani, Director of Centre for Research on Human Resources and the Environment, University of Indonesia. This Centre has a strong research staff, including some medically qualified, with a reputation for research on the urban environment. This could include urban agriculture, should an opportunity presents itself. The Centre is well financed and equipped with very respectable facilities.

- Id Ayu Indira Murp, of the Institute of Urban and Regional Studies at the Institute of Technology in Bandung. She is trained as an urban planner, having demonstrated her ability to produce good work in recent professional meetings I have attended with her.

- Dr. Arunia Firdausy, Research Associate of the Centre for Economic and Development Studies, LIPI. He obtained his Ph.D. in Economics from the University of Queensland and has produced good research papers on urban issues in Indonesia.

Finally, on the question of institutional partners in support of urban agriculture research in the region, one might explore two logical places. One is the East-West Center whose Resource Systems Institute was very active in the field in the early 1980s. However, recent reorganization at the Center might have reassessed possibilities and involved personality changes. Nonetheless, in terms of past involvement, it is necessary to explore. The second place to look is UNDP and the World Bank, which jointly and recently commissioned a study on Urban Agriculture in Latin America, Africa and Asia by Jac Smit of Regional and Community Development Consultants. The contact person at UNDP is Frank Hartvelt and at the World Bank, Bruce Gross. The report by Jac Smit was recently available and an abbreviated version of it appeared in *Environment and Urbanization* (October 1992).

3. FUTURE RESEARCH OPPORTUNITIES

Based on the URB Program document and the above review, it is possible to suggest at least three research topics for which Centre support can be considered.

3.1. Urban poor and food sources

This project attempts to focus on the food production-nutrition interface by a targeted investigation of how the urban poor in selected cities in the region supplement their food requirements by home production. It is hypothesized that those who have access to homegrown food will have better nutrition than those who have only the market to depend on for their food supply. The urban poor would therefore have to be sampled in two subsectors: those with homegrown food and those without. The former are likely those who live on the urban periphery or otherwise have access to food-growing land or other types of food. The study will help to establish the links between urban agriculture and the urban poor, and within the latter different disadvantaged groups by ethnic affiliation and other criteria may be used for differentiation.

Such a study can also investigate the economic, legal and policy constraints that impede food production by the urban poor. A comparative study across cities and countries in the region can yield information that will enable policy makers to take a more sympathetic and enlightened view of how the urban poor could be assisted in producing their own food. The study will also yield insights as to whether dependence on home-produced food will increase with the size of the city and the socioeconomic status of the family.

In order to carry out such a study, it is submitted that a comparison of three countries in Southeast Asia involving a large- and a medium-sized city in each would best capture the variation of the study problem. For consideration, the cities for inclusion might include Manila and Baguio in the Philippines, Jakarta and Yojakarta in Indonesia, Bangkok and Chiang Mai in Thailand.

Researchers who might be considered for taking a lead role in this project include Cayetano Paderanga of the Faculty of Economics of the University of the Philippines, Dr. Mohammed Soerjani of the University of Indonesia, and Dr. Watana Isarankura of the National Institute of Development Administration in Thailand. Details of their professional background as well as their institutions have been provided in the previous section.

3.2. Waste reuse and fish farming

In Asian cities, organic wastes have traditionally been used efficiently to turn into food production in various ways. Food wastes, for example, have been used to feed pigs and restaurants regularly dispose of their food wastes in this manner for useful recycling in Chinese communities in Asia. In a detailed study of nutrient flows in Hong Kong undertaken by an Australian team in the 1970s, one of their conclusions was to argue strongly in favor of keeping existent practices of food recycling, with very much in mind effective food wastes for pig feeding. For this reason, it was recommended that the people of Hong Kong should not turn to beef over pork, for the sake of maximizing use of organic wastes. Another example of an age-old practice of utilizing organic waste for food production is the application of plants and other organic wastes, such as droppings from silk worms, to feed fish. The ecological cycle is perfected by growing mulberry trees to feed silk worms, whose wastes are fed to fish in ponds, and this is connected to the raising of pigs. Hence the mulberry-dyke-pond cycle in the Pearl River Delta.

It is submitted that because of the onslaught of modernization and industrialization, the traditional organic waste recycling might have been adversely affected. This is particularly the case in the Pearl River Delta in Guangdong, which has witnessed exceptionally rapid economic development and environmental change over the past decade in the wake of the open policy adopted by China. In Hong Kong and Bangkok, where the demand for fish and seafood is always high, the pressure exerted on fish ponds to yield to other more intensive use has constantly been increasing. In the Yuen Long area of Hong Kong, the once scenic fish pond area is rapidly changing to a landscape of new residential homes and other uses. Fish farming has moved offshore to about 30 designated areas, which are subject to water pollution and occasional red tides. Similar changes are also occurring in Bangkok which also has to cope with a rapid pace of urban change.

A project aimed at establishing the relationship between waste-reuse, in particular organic waste recycling, is extremely useful in showing how traditional ways of utilizing organic wastes might have been reorganized and adjusted to new circumstances. Ideally, every means should be found to reuse waste to food production, and in this respect the Chinese experience, whether in China itself or Chinese communities in Southeast Asia, has everything to offer for other situations.

This project should be building on some known ways of waste recycling but from

this known base, it may open up other possibilities and opportunities. The practical outcome of this project will assist operators and planners on how to treat and better use organic and other waste in the urban area. As a way of approaching the subject, it is suggested that fish farming would be a useful vehicle.

Potential researchers in this comparative study may include Professor Zhong Gongfu of the Institute of Geography in Guangzhou. He is a world-established authority on the mulberry-dyke-pond system and has published extensively on the subject. He retired recently but is still active in research. A sample of areas in the Pearl River Delta should update and extend his previous studies. Hong Kong can usefully contribute to this study, with Dr. K.C. Chau, of the Department of Geography at the Chinese University of Hong Kong, as a likely researcher to study the Hong Kong situation. Bangkok with its large Chinese community and their tradition of recycling waste can also be included. Dr. Pawadee Tongudai of Thommasat University could be considered as a candidate to lead a project.

3.3. Vegetable supply and new technology

In virtually every Asian city, an adequate supply of fresh vegetables ranks high as a basic need for its inhabitants. This is especially the case in Chinese cities in the south and in Southeast Asia. As vegetables are highly perishable, it is therefore vital for growing areas to be located within convenient transport distance from markets in the city. In Chinese cities, an effective system of near self-sufficiency has been developed for most large cities, with the city region spatially differentiated to meet the needs of urban dwellers. In other cities in the region, the supply routes might take longer, as it is known that certain vegetables in Singapore routinely come from the Cameron Highlands in West Malaysia, some 350 km to the north.

Traditionally methods of growing vegetables are efficient but in the face of new consumer tastes and demands, new technology has been utilized for producing certain types of vegetables for special needs. The use of hydroponics, for instance, is common in Singapore and other cities, where there is a lack of land space for growing and other reasons for using the new technology. Hydroponics normally is used for producing high-quality and high-priced vegetables for a more select market. There are also new breeds resulting from scientific research, but something comparable to the miracle rice or high-yielding varieties in rice and wheat has not apparently come to vegetables.

A project can thus examine the vegetable supply of selected Asian cities over at least two seasons by studying the spatial distribution of growing areas by broad categories of vegetables. The degree of self-sufficiency can be established and if vegetables need to be imported, from where, at what price, and over what distances? Is there any attempt to adopt new technology and growing methods by the farmers and authorities? Is the present system of supply and demand well articulated and efficient? Where are the bottlenecks and constraints? Is there any research done on improving vegetable types and their growing?

The answers to some of the questions posed above would provide some useful information for policy-making and ways of improving the present system of production and marketing. One of the problems identified in Hong Kong in its supply of vegetables from Shenzhen across the border is the use of banned insecticides, with the result that outbreaks of poisoned vegetables affecting the health of inhabitants recur. There is therefore an active campaign in Hong Kong for the lessened reliance on chemical fertilizers and insecticides, in preference for organic methods of farming. This is one aspect of the green movement in Hong Kong. This is one dimension, for example, such a study might be able to help. However, Hong Kong is not suggested to be in this study.

The cities proposed for this network project are Shanghai, Kuala Lumpur and Seoul, providing different cultural and societal settings in which vegetable supply and new technology can be comparatively studied. For Shanghai, Ning Yue-min, of East China Normal University, can be considered to lead a project. Professor Lim Tech Ghee is the best qualified person for a Kuala Lumpur study. A study on Seoul can be undertaken by Professor Ki-suk Lee. Details of the professional background of these researchers have been provided in the previous section.

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